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HOUSING AFFORDABILITY: A SUPPLY-SIDE TOOL KIT FOR CITIES

BRIEFING NOTE
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One feeling unites billions of people in cities around the world: a sense of sticker shock whenever they attempt to find a new home. From London to Lagos, housing costs are creating financial stress for a large share of the world's urban residents. Rents and home prices have risen far faster than incomes in most countries, particularly in big cities where many people want to live and where job opportunities are concentrated. The issue affects everyone from slum residents living on the margins to middle-income households.

At the heart of the issue is an extreme imbalance in supply and demand. Population growth, the continuing trend toward urbanization, and rising global incomes are all fueling steady demand increases. In 1950, New York City and Tokyo were the only two cities on earth with populations of more than 10 million; today there are more than 20 cities of that size. The world's urban population has been rising by an average of 65 million people a year over the last three decades, led by breakneck urbanization in China and India.

The housing stock of expensive urban centers around the world has not expanded quickly enough to keep up with this surge in demand. Research from the McKinsey Global Institute (MGI) has examined the scope of the affordable housing gap. California, for instance, added 544,000 households but only 467,000 net housing units from 2009 to 2014. Its cumulative housing shortfall has expanded to two million units. With home prices and rents hitting all-time highs, nearly half of the state's households struggle to afford housing in their local markets. In New York City, MGI estimates that 1.5 million households cannot afford the cost of what we define as a decent apartment at market rates. This puts the city's total "affordability gap" at $18 billion a year or 4 percent of the city's GDP. As London's economy has boomed over the past two decades, the city's annual home completions increased by just over 10 percent, falling far short of demand and driving home prices five times higher.

Worldwide, MGI has estimated that some 330 million urban households currently live in substandard housing or stretch to pay housing costs that exceed 30 percent of their incomes. This number could rise to 440 million households by 2025 if current trends are not reversed. Beyond the human toll, this issue eventually constrains economic growth. Investment in housing construction remains below its potential, and households with a disproportionate share of monthly income going toward rent or mortgage payments have to limit other forms of consumption. Returning to our example in California, MGI estimates that the housing shortage causes the state to lose $140 billion in annual output, or 6 percent of state GDP.

The legitimate interests of investors, particularly in a low-interest-rate environment, can add fuel to the fire. Foreign capital flocks into global hubs, and

residents feel compelled to leverage up to achieve home ownership or add hard assets that are appreciating in price. In the hottest markets, these trends are sometimes amplified by speculative behavior such as land hoarding or fast-paced property flipping.

Some governments have taken steps to cool real estate markets that are overheated by investors. These approaches include China's moves to discourage land hoarding by imposing a tax on idle land; additional taxes on value gain and limits on foreign and secondary home ownership in Switzerland; Canada's recent imposition of stress tests for home loans and tighter rules for mortgage insurance; and Germany's limits on loan-to-value financing ratios. These types of measures work best when they are complemented by flourishing rental markets that allow average citizens to save for down payments without facing a shortage of housing options.

National and local governments around the world often address housing gaps by focusing on the demand and financing side. Strategies such as housing subsidies, privileged financing, or various forms of rent control offer much-needed relief to the low-income households they cover, and they are legitimate policy choices if carefully designed. But they are expensive and difficult to sustain—and they do not address the core issue of an underlying housing shortfall.

It will take a dramatic increase in the number of available housing units to achieve greater affordability. Of course, the simplicity of this statement belies the complexity of executing on it. Because progress has been so elusive, this briefing note will focus solely on supply-side solutions, addressing three challenges that all cities have in common: finding available land, removing barriers, and making the construction sector more productive.

1. FIND THE LAND

Access to land is typically the biggest constraint on housing development and one of the major drivers of cost. In places such as Rio de Janeiro and Auckland, the cost of land often exceeds 40 percent of total property prices. In extreme cases such as San Francisco, land is so scarce that it can account for as much as 80 percent of a home's price. Globally, we estimate that unlocking land to the fullest extent could reduce the cost of owning a standard housing unit by up to 20 percent. A comprehensive citywide mapping and inventory exercise can unearth many opportunities. Based on our past work in urban environments, we have identified seven places to focus.

Prioritizing transit-oriented development

It is critical for congested cities to promote density around transit rather than encouraging sprawl and longer commutes. Transit-oriented development may involve redeveloping existing residential structures or encouraging new builds by permitting higher floor-space ratios, loosening height restrictions, or allowing greater density in specific target zones. These zones can be selected to promote local objectives, such as reduced dependence on private vehicles or the development of mixed-use, pedestrian-friendly cityscapes. Places such as Hong Kong and Seoul have already intensified land use around transit stops. Seoul allows floor-area ratios that are up to 20 times higher in better-connected neighborhoods than in more distant areas. Other cities can follow this approach. Analysis in San Diego, for example, found that increasing the density of residential developments in a half-mile radius around public transport nodes could expand the city's housing stock by close to 30 percent.

Getting more out of underutilized sites

In many cases, cities may not even need to increase density thresholds. They can build out on residential parcels that are not taking advantage of currently allowed density. Sites that are underutilized can be identified as priorities for redevelopment. Incentives (such as expedited permitting, relief from parking requirements, or investment in public parking) can make these types of projects more attractive to developers. MGI's analysis in Los Angeles found that 28 percent of parcels zoned for multifamily development are underutilized; maximizing them could add more than 300,000 units to the city's housing stock.

Putting vacant urban parcels to work

Another strategy involves building infill housing on vacant parcels. Even dense neighborhoods may have empty lots that could serve as viable sites. A surprising amount of land sits idle in the face of huge unmet housing demand. Our analysis finds, for example, that Riyadh, Saudi Arabia, has some 40 square kilometers that are zoned residential but are not being utilized, while about 40 percent of

all zoned residential land within Nairobi is vacant. Taxes on idle land can create an incentive to build.

Making public land available

Where appropriate, governments can earmark unused public lands for housing development. Transit authorities may own property surrounding busy transport nodes. Decommissioned sports facilities, military bases, or transit hubs may also be viable sites. It is often easier to facilitate low- or middle-income housing on these types of sites than on typical residential parcels, since public authorities can make the transfer or sale of the land contingent on the development of affordable housing. They may even directly subcontract development of housing in these areas. Turkey's Mass Housing Administration (TOKI) has managed to open up some 4,120 square kilometers of unused land (or 4 percent of total urban land) from other government agencies for housing development. San Diego could add roughly 4,000 housing units by converting disused sports facilities into mixed-use commercial and residential developments.

Transforming industrial sites

Some cities may have opportunities to convert light industrial sites. Large unused industrial parcels (such as shuttered factories) can offer tremendous development potential. But converting them to residential use should involve careful consideration of the impact on jobs and whether any commercial activity on surrounding sites would pose issues for residents.

Going greenfield

Cities surrounded by undeveloped or agricultural land can invest in greenfield housing projects on their outskirts. Although greenfield developments typically involve building infrastructure, roads, and new neighborhoods, they may still be cheaper than infill projects if the land is more affordable and if there is room to achieve economies of scale on multi-acre sites. Greenfield developments open up the possibility of building single-family homes, which are less feasible in dense urban cores. In California alone, we estimate that greenfield developments could provide more than 600,000 additional housing units. Despite their advantages, cities should learn from mistakes made in locations as diverse as Cairo and Mexico City; if greenfield developments are built too far from existing employment centers or transit hubs, they can fail to attract or retain residents.

Adding accessory dwelling units

Finally, many cities can encourage the owners of single-family homes to add accessory dwelling units. These may include garage apartments, basement apartments, or backyard cottages. It does not matter whether they house extended family or renters. Accessory dwelling units are inherently affordable because they use existing land, buildings, and infrastructure, resulting in a sort of "invisible density." MGI's research in California found that homeowners could add up to 790,000 housing units across the state from such structures.

2. CITIES HAVE TO REMOVE THE BARRIERS

Cities have to develop governance structures that represent all stakeholders (not just the most entrenched, powerful, or vocal) and streamline the actual execution. Several approaches can help.

Aligning for better delivery: Delivery labs and integrated housing agencies

Housing strategies are enormously complex, involving initiatives and policies across financing, urban planning, infrastructure development, land use regulation, building codes, delivery and contracting approaches, and more. But stakeholders from different parts of the system rarely work together to smooth frictions and focus on the broader goal of getting more affordable housing built quickly.

The "delivery lab" model addresses this lack of coordination by bringing together 30 to 40 people across these specialties for fast-paced, intensive working events. Labs are designed to translate high-level housing strategies into detailed initiatives, implementation plans, and key performance indicators. In these settings, public- and private-sector stakeholders can address misperceptions and arrive at joint solutions. Labs can produce integrated plans that clarify expectations and synchronize timelines for what each player agrees to deliver. Getting the right people around the table is critical. Sessions should be well-facilitated, with consultation from external topic experts. Each stakeholder should be represented by someone with enough seniority to make quick decisions, and the top sponsor (for example, a city mayor) should personally attend and guide key sessions.

The delivery lab approach has had a major positive impact on the housing market in Saudi Arabia. The government invited all stakeholders across the

public sector (all ministries and government entities related to housing) and private sector (including representatives from real estate developers and banks). Citizens' voices were also heard through the use of social media and focus groups.

These events took a multidisciplinary approach to identifying the key challenges in the housing sector and devising solutions with clear targets, implementation plans, accountability, and budgets. The labs have aligned stakeholders around high-impact ideas that take practical considerations into account. To give just one example, the labs identified last-mile infrastructure connectivity as an issue that was delaying the development of large land parcels and creating uncertainty that deterred developers. Cross-disciplinary problem-solving quickly came up with solutions, such as an infrastructure company focused on building these last-mile connections using a build-operate-transfer model.

The outcomes from successful labs are a good foundation, but actual implementation is crucial. A city government can accelerate progress by empowering an agency or unit with a mandate to guide housing delivery from end to end. This type of unit needs exceptional talent with good problem-solving skills, stakeholder management and communication skills, and significant decision-making power or direct access to the top decision-maker. San Diego's Housing Commission, for instance, hires private-sector talent, has an in-house real estate development team, and invests in marketing and communications. Turkey's TOKI agency has wide-ranging control over land resources, and it uses both public-private partnerships and direct contracting to ensure that housing units are built for citizens across the income spectrum.

Engaging more stakeholders and overcoming NIMBYism

Although most people agree in the abstract that more affordable housing would be a good thing, opposition often halts specific proposals. Existing residents may be concerned about the changing character of their neighborhoods, the prospect of lower home values, congestion, and crowding in schools. To accommodate these concerns, many jurisdictions have established processes such as public hearings or ballot initiatives that carry veto power. While the intent to give the community a voice is noble, the result is often that very little housing gets built.

Cities need to take an inclusive approach to providing housing for people of all incomes, ages, and demographic groups. People who come to a city to work need to be able to find an affordable place to live there. But the voices of existing homeowners who want to preserve the status quo often drown out those of newcomers, young adults, low-income service workers, and renters who need more housing. After a 2009 audit found that neighborhood councils were not representative of the city's broader population, Seattle replaced these bodies with a central Community Involvement Commission that includes mayoral and council appointees chosen to represent a broader set of stakeholders.

Cities can also mandate a larger role for employers in the community input process. Companies have a very real stake in housing issues, since the availability of housing directly affects their ability to attract talent. Amid the extreme housing crunch throughout Silicon Valley, for example, Facebook has advanced plans for a mixed-use, mixed-income residential and commercial campus in Menlo Park.

While many cities hold public hearings and disclose minutes of meetings, there are ways to make the planning process more dynamic and inclusive. Widely distributed digital surveys and the use of analytics tools (such as City Voices) to track citizen sentiment and real-world use patterns can keep housing decisions more in tune with the actual needs of the community and lessen the influence of smaller entrenched interest groups. Creating an open-source map of all city parcels overlaid with development opportunities can foster debate about priorities. Tools such as Owlized can help residents visualize proposed projects in their neighborhood in 3D.

Speeding up

A maze of regulation is typically associated with land acquisition, zoning, and building codes. In many jurisdictions, developers need to go through extensive environmental studies, design approvals, and public hearings. These safeguards are well intended, but they can add inefficiencies. Wrongful manipulation of the approval process can result in multiyear delays and millions of dollars in added development costs. This increases the risk premium associated with building projects, driving up costs for renters and would-be homeowners and preventing some projects from being undertaken at all.

Cities can streamline their processes to fast-track land use approval and permitting, creating a more predictable and less burdensome process. Establishing "single-window" clearance (that is, consolidating approvals from multiple agencies into one clear interface) and digitizing permit applications and status tracking are clear places to start. Cities around the world, from Singapore to Nairobi, have had success with this approach. Simplifying the required permits can provide significant relief. Australia, for example, was able to cut the number of regulatory procedures and speed up permit approvals by over two months, all while maintaining high construction quality.

Cities could consider establishing "by-right" special development zones in select areas where deviations from city zoning and land use codes are permitted with minimal review. Blanket environmental reviews could clear requirements for future developers in entire zones. Governments could also create appeals boards at the local level for faster resolution of project rejections or mitigation proposals.

Local governments can also bring a new approach to building codes. Today these codes tend to be highly prescriptive about the choice of equipment, materials, and designs that construction companies must use. This can stifle innovation and make it difficult to achieve meaningful improvements in productivity by adopting new practices. Instead, cities could opt for "outcome-based" regulation that requires safe, sound results (such as structural integrity) but give construction firms the flexibility to decide how to achieve them.

Scaling up and creating incentives for efficiency and innovation

Building projects on a larger scale can dramatically change the productivity and cost of delivering housing, making it possible to employ techniques such as repeatability and offsite fabrication. A number of companies take this approach while trying to incorporate design quality and variability as well as sustainability. Cities can support industry innovation by providing the land and infrastructure that allow for scale, tendering out city-scale developments, and consolidating high-volume demand.

Where cities themselves invest in housing or supporting infrastructure, contracts can be a powerful lever for raising construction productivity. In an MGI global survey, construction executives, suppliers, and project owners pointed to misaligned incentives and contracts as impediments. Projects are often awarded to the lowest bidder with limited regard to quality, change orders, and claims that might arise after the fact. The planning stage may be given short shrift, while overly detailed specifications can limit flexibility when problems arise. Risks are often misallocated, and contracts generally fail to take the inherent uncertainty of projects into account. Furthermore, relationships may be adversarial, creating an environment that lacks trust and genuine collaboration.

Moving to value-based tendering (which places greater emphasis on the quality and past performance of suppliers), adding contractor and owner incentives to traditional contracts, and making provisions to improve transparency and collaboration can deliver tremendous value. An even bolder approach involves contracts with an integrated project delivery (IPD) model. When arrangements with multiple contractors are transactional, they can easily turn hostile. But the IPD model encourages multiple stakeholders to collaborate closely on a project, sharing its profits or losses while maintaining their separate business identities. Tired of missed deadlines and budget overruns on early projects, Sutter Health, a not-for-profit health system with dozens of medical centers, took this approach to tighten up its $7 billion capital improvement project. The company designed an IPD model, assigning contracts to integrated teams of designers, consultants, and builders rather than to individual parties. The new approach has yielded projects that came in on time and under budget.

Finally, by mandating use of efficient technologies and innovations in their procurement contracts, cities can hasten private-sector adoption and investment in cost-saving tools. Requiring contractors to submit models in building information modeling (BIM) software, which has a track record of fewer errors and reduced rework, can solidify better industry standards and practices.

3. THE CONSTRUCTION INDUSTRY HAS TO EVOLVE

Even when land is available and there is no community opposition, construction itself poses risks. Too many projects come in late, over budget, or fraught with problems. Productivity within the construction sector is consistently poor around the world. Labor productivity growth averaged 1.0 percent a year over the past two decades, compared with 2.8 percent for the total world economy and 3.6 percent for manufacturing. The picture is particularly dismal in advanced economies. In the United States, for instance, labor productivity as measured today is lower than it was half a century ago.

Some of this is due to external factors such as cumbersome building codes and permitting processes as well as cyclical swings in public and private demand. Informality and corruption sometimes distort the market. At the industry level, construction is highly fragmented, contracts have misaligned incentives, and inexperienced owners and buyers find it hard to navigate an opaque marketplace. At the firm level, we often see poor project management, inadequate design processes, and a lack of investment in technology, R&D, and workforce skills.

Pushing forward with best practices to boost productivity

While cities can create a more efficient environment and incentives for innovation, construction firms also have to up their game. The best-performing firms take a value engineering approach to the design process, pushing for repeatable design elements whenever possible. They also avoid delays by focusing on procurement and supply-chain management for just-in-time delivery.

Several approaches can improve onsite execution, starting with a rigorous planning process and the completion of all prework before starting onsite. To ensure that key activities are achieved on time and on budget, companies should agree on key performance indicators, particularly for subcontractors, and hold regular performance meetings to monitor progress and solve issues. It takes careful planning and coordination of different disciplines onsite along with the application of lean principles to reduce waste and rework.

The construction industry also needs to accelerate digital adoption. This includes the use of BIM tools for design as well as analytics and the Internet of Things for onsite monitoring of materials, labor, and equipment productivity. Cloud-based control towers can coordinate large-scale, complex projects, assembling data in near real time that is both backward-looking and predictive. They can keep information flowing to owners, contractors, and subcontractors. Techniques and data that are readily available today can produce large improvements in the accuracy of cost and schedule estimates as well as engineering productivity. Advanced automated equipment such as bricklaying and tiling robots can accelerate onsite execution. MGI's productivity survey indicated that the biggest barriers to innovation by construction companies are underinvestment in technology and a lack of R&D.

Transitioning to a production system approach

Construction is almost always approached as a series of discrete and bespoke projects. But the biggest boost in productivity comes with the concept of a manufacturing-inspired mass-production system. This involves more standardized elements, panels manufactured and assembled offsite, and limited finishing work conducted on site.

Barcelona Housing Systems, for instance, has improved productivity by up to 10-fold by moving away from traditional onsite construction to large-scale industrial delivery and prefabrication. The company aims to develop more than 10,000 housing units per project, helping to amortize the cost of manufacturing facilities. It uses a replicable design of four-story multifamily buildings that mix housing, retail, and service-oriented office space, varying some facade and design elements without changes to the structural design. All necessary housing components are assembled from prefabricated modules built in a factory on-site or nearby, and the components are simple enough to be built by non-skilled workers with minimal training.

The Value & Budget Housing Corporation, a modular housing provider from India, designs prefabricated room components that can easily convert one-bedroom units to two- or three-bedroom units, saving costs by avoiding extra aluminum framework. Such construction techniques can be applied in a variety of different housing contexts, including prefabricated single-family homes as well as detached dwelling units and modules for multifamily infill projects.

Modular home construction is gaining traction in the United Kingdom as well. A company called Legal & General, for instance, is building one of the largest modular production facilities in the world near Leeds, where it expects to produce up to 4,000 units a year. The £3 billion UK Home Building Fund explicitly calls for and supports the funding of such techniques.

US-based Katerra uses modular construction techniques while delivering construction services to customers in an end-to-end model. The Silicon Valley startup takes sole responsibility for design, sourcing materials from a global supply chain, and assembling final products. The company is focused on using new building materials and finding process improvements by deploying the Internet of Things.

Other technology breakthroughs are being applied as well. Shanghai-based WinSun automates construction through 3D printing. Although relatively new, the technique has already been used in a few cities: Saudi Arabia has signed a contact with Win-Sun to develop 30 million square meters of real estate, on the heels of the company's development of a 3D-printed office building in Dubai.

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Finding an affordable place to call home has become an issue for citizens around the world. Subsidies and financing solutions alone cannot close the gap. Cities urgently need to ramp up home building to improve residents' quality of life, remain inclusive, and ensure that housing shortages do not become a drag on economic growth. The tools and strategies outlined here can be pursued in parallel—and given the extent of unmet demand today, there is no time to lose.

REFERENCES AND FURTHER READING

McKinsey Global Institute research is available for download at **www.mckinsey.com/mgi**. This briefing note draws on the following reports.

Reinventing construction: A route to higher productivity (February 2017)

A tool kit to close California's housing gap: 3.5 million homes by 2025 (October 2016)

Urban world: Meeting the demographic challenge (October 2016)

A blueprint for addressing the global affordable housing challenge (October 2014)

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